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ENVIRONMENTAL

SITE REMEDIATION
WATER RESOURCES
ECOLOGICAL SCIENCES
EHS MANAGEMENT

November 30, 2010

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DEPT. OF ENVIRONMENTAL CONSERVATION

Dennis Harwood
ADEC Technical Services and Risk Assessment
555 Cordova Street
Anchorage, AK 99501

Subject: November 23, 2010 Site Inspection; 4th and Gambell Site; Anchorage, Alaska; NTP 18-4002-11-007B

Dear Mr. Harwood:

This letter presents information obtained during a site inspection of the North Duplex and South Duplex at 736 East Third Avenue on November 23, 2010. This site inspection was to observe and document the submembrane depressurization (SMD) systems that were installed by the former property owner (Mark Cupples) between the March and June 2009 vapor intrusion sampling events. Figure 2 shows the location of the North and South Duplex buildings at the 4th and Gambell site.

HISTORICAL BACKGROUND

A vapor intrusion assessment sampling event was performed for the North and South Duplex buildings during March 2009. North Duplex sampling consisted of a crawl space air sample at location CS-1; an outdoor air sample at location AA-2; and a soil gas sample at SG-3 (Figures 7 to 10). The South Duplex sampling consisted of a crawl space air sample at location CS-2; an outdoor air sample at location AA-2; and a soil gas sample at SG-4. The indoor air concentration of PCE in the sample from the crawl space locations at the North Duplex (CS-1) and the South Duplex (CS-2) exceeded the ADEC indoor air target level of 4.1 $\mu g/m^3$. The property owner installed an SMD system at each of the duplexes after the March 2009 sampling results were obtained. Since then ADEC has continued to monitor the crawl space air at both of these duplexes during vapor intrusion sampling events performed during June 2009, February 2010, and May 2010. The June 2009 crawl space results for the South Duplex were below ADEC indoor air target level but all remaining crawl space air sample results from the duplexes have been above the ADEC indoor air target levels (Figures 7 to 10). These results have prompted ADEC to perform a site inspection of the SMD systems to evaluate why these systems have not been effective in reducing the crawl space air sample concentrations.

SITE INSPECTION

On November 23, 2010, OASIS Environmental (Tim McDougall) and ADEC (Todd Blessing) did inspect the SMD systems for the North and South Duplex at 736 East 3rd Avenue at the 4th and Gambell site in Anchorage, Alaska. Figure 2 shows the location of the North and South Duplex in relationship to other buildings at the 4th and Gambell site. Figure 3 is a schematic of the SMD system at the North Duplex. A similar SMD system is present at the South Duplex except that the entire area under the duplex is a crawl

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space without any concrete slab. Photographic documentation of the site inspection is included in Attachment 2.

- North Duplex – Photographs 1 through 4 in Attachment 2 show that there are several penetrations through the membrane liner used to seal the crawl space. These penetrations prevent a complete seal of the soil gas contained beneath the building and even though the SMD air pump is operating it is unable to capture all of the subsurface soil gas contamination that is being pulled into the crawl space. Due to furnace operations and house stack effects that occur during cold atmospheric conditions we would expect the crawl space concentrations to be greatest during the winter months. The house stack effect is illustrated and described in Attachment 2 Picture #8.
- South Duplex – Photographs 5 through 7 in Attachment 2 show that the South Duplex crawl space membrane seal appears to be complete and well sealed with no visible penetrations. Due to the restricted access to the crawl space we were unable to verify that the SMD pump was operating at the time of inspection. The exhaust pipe exiting the side of the duplex was also checked but no discernable air flow could be observed.

RECOMMENDATIONS

OASIS recommends that the membrane liner penetrations and joints at the North Duplex be repaired and sealed. Once completed a vacuum test of the system can be done to determine if the SMD is generating sufficient vacuum to withdraw vapors from below the liner. A new set of vapor intrusion samples can then be collected to confirm that the SMD systems are being effective in reducing the crawl space contaminant concentrations. Both of these SMD systems are discharging directly outside the building near the ground surface, to prevent potential exposure to the discharged air it is also recommended that the vent pipes be extended up the side of the structure to a location above the roof line.

Please call me at 258-4880, or email me at t.mcdougall@oasisenviro.com, if you have any questions or comments.

Sincerely,

OASIS Environmental, Inc.

Tim McDougall
Project Manager

cc:

Todd Blessing, ADEC Project Manager

Attachments:

1. Figures
2. Photographs

ATTACHMENT 1

FIGURES

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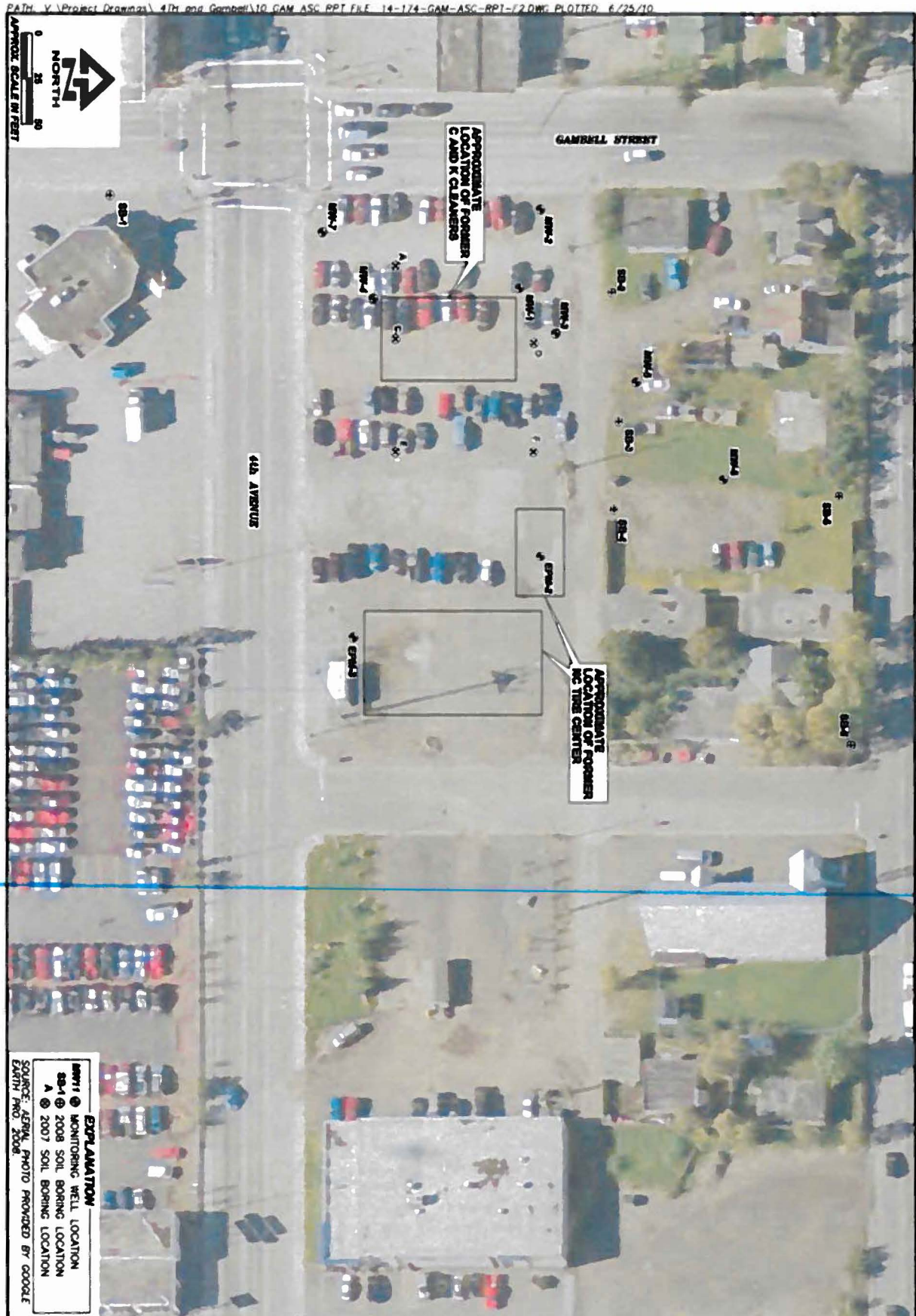
PATH: Y:\Project Drawings\ 4Th and Gambell\10 CAM ASC RPT FILE 14-174-CAM-ASC-RPT-F2.DWG PLOTTED: 6/25/10



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DATE: JUNE 2010
CHKD: B.J.M.
DRAWN: C.E.H.
PROJ. No.: 14-174

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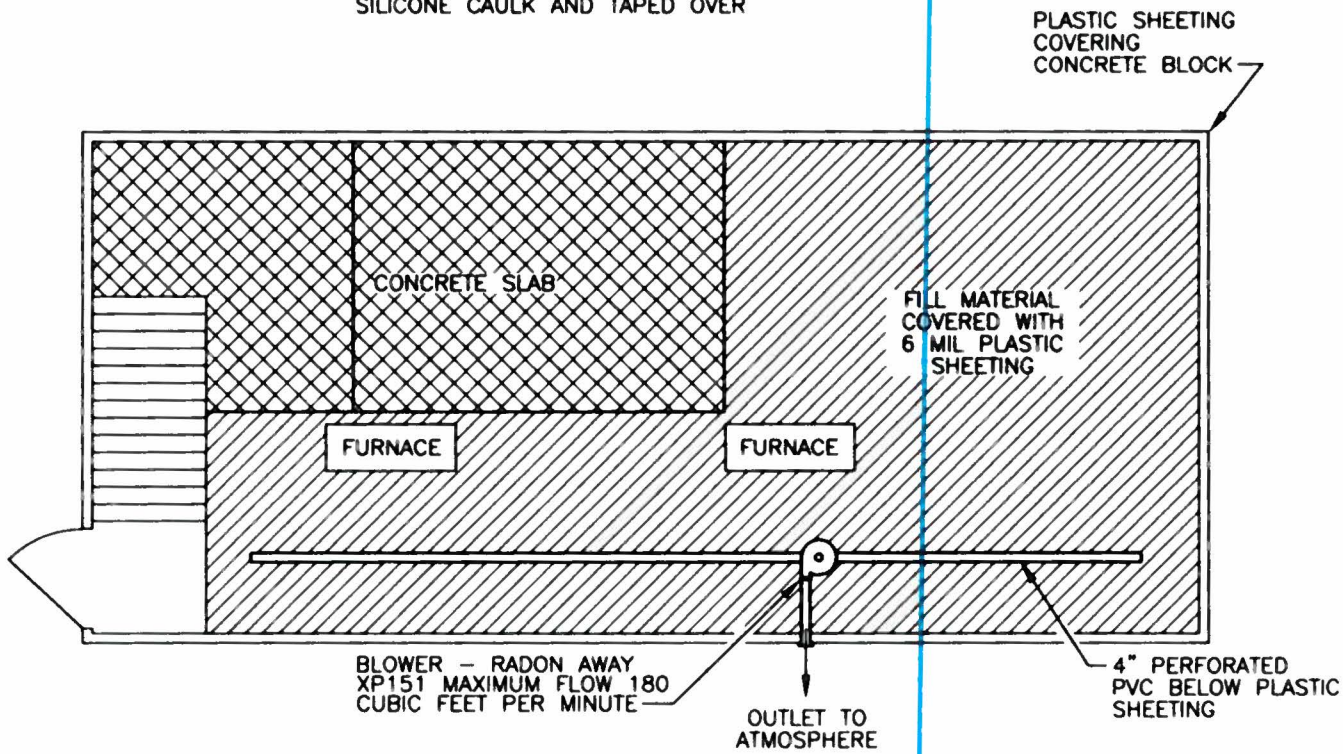
PREVIOUS SAMPLE LOCATIONS

4TH AND GAMBELL
ADDITIONAL SITE CHARACTERIZATION
Anchorage, Alaska

FIGURE
2

PATH: V:\Project Drawings\4TH and Gambell\09 GAM VI RPT FILE:14-139-GAM-VI-F3.DWG PLOTTED: 7/14/09.

NOTE:
ALL SEAMS BETWEEN PLASTIC SHEETS ARE SEALED WITH SILICONE CAULK AND TAPED OVER



NORTH

NOT TO SCALE

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DRAWN: K.J.S.
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SUB-MEMBRANE DEPRESSURIZATION SYSTEM AT NORTH DUPLEX

4TH AND GAMBELL
VAPOR INTRUSION ASSESSMENT
Anchorage, AK

FIGURE

3

PATH: V:\Project Drawings\4TH and Gambell\09 GAM\09 GAM VI RPT FILE: 14-135-GAM-VI-RPT-A.DWG PLOTTED: 4/1/09..

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ANALYTICAL RESULTS (MARCH 2009)

4TH AND GAMBELL
VAPOR INTRUSION REPORT
Anchorage, Alaska

FIGURE
8

PATH: V:\Project Drawings\4TH and Gambell\09 GAM\09 GAM VI RPT FILE: 14-135-GAM-VI-RPT-A.DWG PLOTTED: 4/1/09

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DRAWN: K.J.S.
PROJ. No.: 14-139

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ANALYTICAL RESULTS (JUNE 2009)

4TH AND GAMBELL
VAPOR INTRUSION REPORT
Anchorage, Alaska

FIGURE
10

PATH: V:\Project Drawings\ 4TH and Gambell\10 GAM ASC RPT FILE: 14-174-GAM-ASC-RPT-F7.DWG PLOTTED: 6/25/10.

SOURCE: AERIAL PHOTO PROVIDED BY GOOGLE EARTH PRO. 2008.

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ANALYTICAL RESULTS (FEBRUARY 2010)

4TH AND GAMBELL
ADDITIONAL SITE CHARACTERIZATION
Anchorage, Alaska

FIGURE 7

PATH: V:\Project Drawings\ 4TH and Gambell\10 GAM ASC RPT FILE: 14-174-GAM-ASC-RPT-F9.DWG PLOTTED: 6/25/10.

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ANALYTICAL RESULTS (MAY 2010)

4TH AND GAMBELL
ADDITIONAL SITE CHARACTERIZATION
Anchorage, Alaska

FIGURE
9

ATTACHMENT 2

SITE PHOTOGRAPHS

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Photographs
4th and Gambell Site Inspection

Photograph 1: North Duplex submembrane depressurization system (SMD). Notice hole in membrane liner below furnace and next to wooden support pier.

Photograph 2: North Duplex membrane liner not sealed to concrete slab and penetrations adjacent to wooden support pier

Photographs
4th and Gambell Site Inspection

Photograph 3: North Duplex – Another photo showing penetrations through membrane liner adjacent to metal pipe with the SMD piping exposed below slit in membrane material.

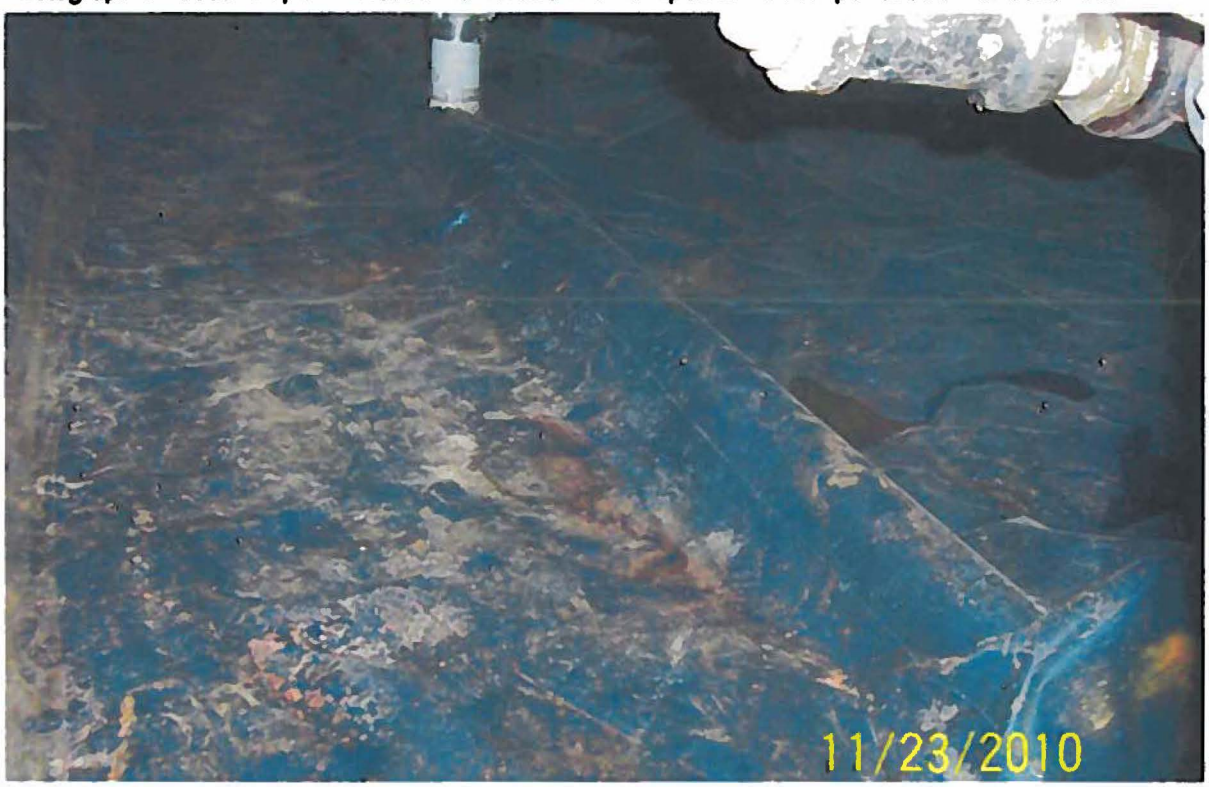
Photograph 4: North Duplex – Exposed SMD piping showing holes on bottom of piping.

Photographs
4th and Gambell Site Inspection

Photograph 5: South Duplex SMD system. No visible holes in membrane liner at this location.

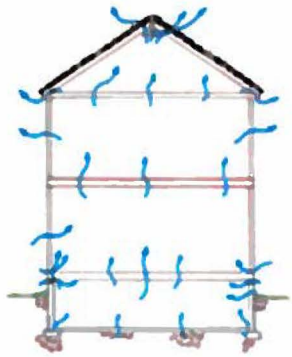
Photographs
4th and Gambell Site Inspection

Photograph 6: South Duplex – Notice membrane liner is taped to vertical penetration for better seal.



Photograph 7: South Duplex – Notice horizontal piping under membrane liner attached to vertical piping and SMD radon air pump.

Photographs
4th and Gambell Site Inspection



Picture 8: House Stack Effect - The "stack effect" is when warm air moves upwards in a house. This happens in summer and winter. Warm air rises - because it's lighter than cold air. So when it rises, what happens? It escapes out of the upper levels of our homes. But we can't create a vacuum in our homes, so when air escapes, new air has to come in to replace the air that escaped. Where does the new air enter the house? ...at the lower levels, through crawl space vents and up from the earth. The stack effect actually causes your house to suck on the ground. Reference www.basementsystems.com